

# A PACKAGE INCLUDING A CONTAINER WITH A WIDE-MOUTH SPOUT AND ENCLOSURE SEALING THE SPOUT

*Sub 7*

5 Cross Reference to Related Application: commonly owned, concurrently filed design patent application entitled "CONTAINER", and identified by attorney docket number 035373-00103.

## BACKGROUND OF THE INVENTION

### Field of the Invention

10 This invention relates to a container with a plastic closure, more particularly to a container with a wide-mouth spout and a closure which seals against the spout for resealably closing the container.

### Background Information

15 It is known to provide a resealable container for granular or fluid product having a wide mouth spout with a closure which seals against the spout. Examples of such packaging are disclosed in U.S. Patent Nos. 5,383,558 and 5,489,036. These containers have a semi-spherical spout with an opening that is 50 to 80 percent of the diameter of the container. The closure has an end wall approximately the diameter of the opening formed by the spout and a double  
20 frustoconical skirt which engages threads on the container below the semi-spherical spout. The closure includes three separate sealing elements extending downward from the end wall: a circular centering sealing rim which forms a plug seal with the container opening; a circular projection which seals against the finish on the container; and a circular flexible flange with a tip which is deflected outward by the  
25 semi-spherical spout.

There is room, however, for improvement in such packaging and especially in the arrangement for sealing the closure.

An object of the present invention is to provide such improved packaging and especially, such packaging with a simple, reliable arrangement for  
30 sealing the container initially and between uses.

# SUMMARY OF THE INVENTION

This object and others are realized by the invention which is directed to a package that includes a container having a main body with an upper portion having enclosure engaging members such as threads, and a spout extending upward and inward from this upper portion and topped with an upwardly and outwardly flared portion terminated by a rim defining a container opening. A closure for the container has an end wall which extends across the container opening when in place, and a skirt extending outward and downward from a periphery of the end wall and having an inner surface with container engaging members adjacent a lower end, which engage the closure engaging members on the container to removably secure the closure to the container. The package further includes sealing elements including an annular sealing flange extending downwardly and inwardly from the end wall of the closure and having an outer sealing surface which engages an inner sealing surface on the flared portion of the container. The sealing elements further include an annular upper portion of the inner surface of the skirt which is inclined downwardly and outwardly relative the outer sealing surface of the annular sealing flange to form with the sealing flange an upwardly converging annular gap into which the rim of the container is wedged as the container engaging members on the closure and the closure engaging members on the container engage.

In accordance with another aspect of the invention, the package includes a container having a main body with an upper portion having closure engaging members thereon and a spout extending upward and inward from the upper portion and terminating in a rim defining a container opening. The closure has an end wall extending across the container opening when in place, and a skirt extending outward and downward from a periphery of the end wall and having an inner surface with container engaging members adjacent a lower end which engaged the closure engaging members on the container to removably secure the closure to the container. The package further includes sealing elements comprising a first seal adjacent the container opening and a second seal comprising an annular sealing member on one of the lower portion on the inner surface of the skirt above the

container engaging members and on the main body of the container above the closure engaging members but below the spout which engages the other of the lower portion of the inner surface of the skirt and the main body of the container.

Preferably, this secondary seal is on the lower portion of the inner surface of the skirt above the container engaging members and engages the main body of the container above the closure engaging members.

### BRIEF DESCRIPTION OF THE DRAWINGS

A full understanding of the invention can be gained from the following description of the preferred embodiments when read in conjunction with the accompanying drawings in which:

Figure 1 is an isometric view of the container which forms part of the package in accordance with the invention.

Figure 2 is a cross sectional view through the upper part of the container with the closure in place.

Figure 3 is a fractional sectional view of a portion of Figure 2 shown in large scale.

Figure 4 is a fragmentary vertical section through the package with the closure in place on the container.

### DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Figures 1 and 4, the package 1 in accordance with the invention includes a molded plastic container 3 having a main body 5 of any suitable configuration. The ornamental configuration shown is the subject matter of the commonly owned and concurrently filed design patent application entitled "Flared Mouth Container" filed in the name of Robert Speelman. An upper portion 7 of the main container body 5 is cylindrical and is provided with closure engaging members 9, which in the exemplary embodiment of the invention, are threads. Other forms of closure engaging means such as, for instance, retention beads or snap rings, could be used alternatively. A spout 11 extends upward and inward from the

cylindrical section 7 and is topped with an upwardly and outwardly flared portion 13 which terminates in a rim 15 defining a container opening 17.

The package 1 further includes a closure 19 which is shown in section in Figure 2. This closure 19 has a circular end wall 21 which extends across the container opening 17 when in place on the container as shown in Figure 4. A skirt 23 extends outward and downward from the periphery of the end wall 21. Preferably, the skirt 23 has a curvature near the end wall 21 and terminates in a cylindrical section 25 which overlies the cylindrical upper body portion 7 of the container when the closure is applied to the container. As illustrated in Figure 2, the skirt 23 has an inner surface 27 which has, adjacent its lower end 29, container engaging members 31 which mate with the closure engaging members 9 on the container 3, and therefore, in the exemplary embodiment are threads.

The package 1 also includes sealing elements 33 which seal the container opening 17 when the closure 19 is in place on the container 3. The sealing elements 33 include a first seal 35 comprising an annular sealing flange 37 extending downwardly and inwardly from the end wall of the closure and, as best seen in Figure 3, having an outer sealing surface 39 which engages and seals against an inner sealing surface 41 on the flared portion 13 of the container 3. An annular upper portion 43 of the inner surface 27 of the skirt formed by an annular rib 45 extends downwardly and outwardly from the end wall to form with the sealing flange 37 and upwardly converging annular gap 47 into which the rim 15 of the container 3 is wedged as the closure is threaded onto the container. The outer sealing surface 39 of the sealing flange 37 forms a first angle  $\alpha$  with the central axis 49 of the container while the inner surface 41 of the flared portion 13 of the container forms an angle  $\beta$  with this axis 49. The angle  $\alpha$  and  $\beta$  are selected such that there is an interference between the sealing surfaces 39 and 41. Thus, the angle  $\alpha$  is larger than the angle  $\beta$ . In the exemplary embodiment of the invention, the angle  $\alpha$  is about  $23.9^\circ$  while the angle  $\beta$  is about  $21.9^\circ$  so that the interference is about  $2^\circ$ . Due to the thickness, and therefore stiffness, of the sealing flange 37, the

flared portion 13 of the container is deformed to the angle  $\alpha$  to provide extended surface and therefore sealing contact between the surface 39 and the surface 41.

Often, the large opening 17 of the container goes out of around during cooling of the resin from which the container is molded. This can make it difficult to provide a good seal. Accordingly, in accordance with the invention, a plurality of circumferentially spaced ribs 51 extend radially inward and axially along the inner surface of the closure skirt 23 and blend into the rib 45. These guide ribs 51 each have a convex radially inward free edge 53 which guides the rim 15 of the container into the gap 47.

As best seen in Figure 2, the sealing elements 33 include a second seal 55 formed by an annular bead 57 integrally molded on the lower portion 59 of the inner surface 27 of the skirt in the cylindrical section 25. This bead 57 which is above the container engaging members (threads) 31 seals against the cylindrical upper portion 7 of the main body 5 of the container above the closure engaging members (threads) 9 as shown in Figure 4 to provide a double seal which assures that moisture does not enter the container.

As can be appreciated, the invention provides a simple double seal between the container and the closure to assure freshness and dryness of the contents of the container. It also assures that despite out of roundness of the container rim, a good seal will be formed.

While specific embodiments of the invention have been described in detail, it will be appreciated by those skilled in the art that various modifications and alternatives to those details could be developed in light of the overall teachings of the disclosure. Accordingly, the particular arrangements disclosed are meant to be illustrative only and not limiting as to the scope of the invention which is to be given the full breadth of the claims appended and any and all equivalents thereof.